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TO: Examiner X. Mei (Group 2644)

COMPANY: United States Patent and Trademark Office

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November 13, 2001

Our Client No.: 3464-003

Re: Please see attached Response.

Attorney Docket No.: 3464-003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : LYDECKER, George et al.
Serial No. : 08/850,996
Filing Date : May 5, 1997
Title : RECORDING AND PLAYBACK CONTROL SYSTEM
Examiner : MEI, X.
Group Art Unit : 2644

November 13, 2001

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Assistant Commissioner for Patents
Washington, D.C. 20231

CERTIFICATE OF TRANSMISSION UNDER 37 CFR §1.8

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RESPONSE TO FINAL REJECTION UNDER 37 CFR §1.116

Sir:

In the Office Action of May 22, 2001, the claims stand finally rejected as being anticipated by, or obvious over the Davis references alone, or in combination with Bergault.

The Applicants respectfully traverse these rejections on the following grounds.

BACKGROUND

The subject application pertains to a recording and playback system, and preferably, as it relates to the present application, to a playback system adapted to receive a high density recording medium, such as a CD, and replay music therefrom. Typically, music is recorded in a studio having acoustic characteristics selected to insure that recording occurs as accurately as possible. The medium is then sold or otherwise distributed potentially to millions of customers, who then use their individual playback systems to replay the music. Each player has its individual characteristics and it is disposed at specific sites, each site having its own playback environment with its own characteristic as well. Thus, each CD is played back under essentially unknown acoustic conditions and therefore the producer of the recording has no control over what the customer hears when replaying a program.

This problem is resolved in the present invention by determining the acoustic characteristics at the recording site, recording control signals corresponding to the characteristics on the medium together with the musical program, and, at the customer's site, detecting the control signals and adjusting the operation of the player in accordance with the control signals and the characteristics of the playback environment. For example, typically, the player at the customer site may include gain/phase circuits, delay/reverberation circuits and/or equalizer circuits, as shown in Fig. 2. These circuits receive respective control signals to compensate for the acoustic characteristics of the recording environment and the acoustic characteristics of the playing environment.

Two different schemes are provided in the application for receiving the acoustic

characteristics of the playback environment,. In a first scheme, the customer enters certain information, such as the size of the room where the player is located, the number and location of speakers, and so forth. The acoustic characteristics of the playback environment are then determined from this information. According to a second scheme, the player has its own microphone and is adapted to generate a test signal and detect the audio signals resulting from said test signal through its microphone. The parameters associated with this received signals are then used to determine the acoustic characteristics of the playback environment.

To summarize, the present invention pertains to four separates aspects:

A. It provides a playback system that receives a medium with a recording including a program and control signals indicative of the acoustic characteristics of the recording environment., and having a multiplexer that separates the control signals, and circuitry that receives said control signals and operates in accordance with said control signals to play back the program.

B. It provides a playback system as described in A with the circuitry also receiving information regarding the acoustic characteristics of playback environment, whereby the operation of the playback system is also affected by the latter acoustic characteristics.

C. It provides a playback system as described in B above wherein information regarding the playback environment is received externally, e.g., from the customer(open loop control).

D. It provides a playback system in accordance with B above wherein the information regarding the playback environment is generated internally based on test

signals (closed loop control).

THE PRIOR ART

The Examiner has taken the position that the claims are anticipated by, or obvious in view of the Davis and Bergault references.

The Davis references disclose a complex system which detects what it terms to be a sound field. The sound field is recorded using several microphones, and the sound spectrum from each microphone is combined into sub-bands. The content of each sub-band from several microphones is then combined, encoded and recorded together with control signals that indicate how to decode and separate the different sub-bands. Thus, the reference presents a unique algorithm for encoding multi-channel sounds. However, this reference has nothing to do with the present invention. In the present invention, the recording of the sound itself is standard and the result is a standard sound recording. More importantly, in the present invention the acoustic characteristics of the recording environment are determined, and control signals are generated to indicate these characteristics. As discussed above, in some aspects of the invention, the characteristics of the playback environment are also determined and the two sets of characteristics are used together to determine how to play the recorded program back. There is nothing in this reference that discusses this feature of the invention. The present invention contains many other features which are also missing from the Davis references. For example, claim 1 recites specific circuitry which is operated in accordance with the acoustic characteristics discussed above, including gain circuits, delay circuits, and so on. There is nothing in the cited Davis references

that perform in this manner.

The Begault reference discloses an apparatus for producing pseudo-stereophonic sound from monaural audio signal using two headphones. It is respectfully submitted that there is nothing in any of these references to show how a system using headphones, one for each side of the head of a listener is applicable in any way to a system in which speakers are distributed over a large area so that many listeners can hear the same sounds. In any event, Begault does not provide any more relevant disclosure than

It is respectfully submitted that each of the Independent claims of the present invention that is not found in any of the prior art references. More specifically, claim 1 recites, inter alia "

A playback system for reproducing audio data and reading acoustic control data from a recording medium, said acoustic control data including information related to the characteristics of the original acoustic environment associated with the production of said recording media, comprising:
a demultiplexer for retrieving audio data and acoustic control data,
said acoustic control data providing a predetermined number N of inputs to

gain and phase circuits,
delay and reverberation circuits,
equalizer circuits, and
gain/attenuation circuits,

said gain/attenuation circuits connected to output to a second predetermined number M of summation channels,

said audio data feeding serially through said
gain and phase circuits,
delay and reverberation circuits, and
equalizer circuits;

wherein the operation of said gain and phase circuits, said delay and reverberation circuits and said equalizer circuits is adjusted in accordance

with said acoustic control data to replay said audio data by recreating said original acoustic environment.

The prior art does not show a demultiplexer or the specific circuitry disclosed.

Claims 21 and recite respectively :

A playback system for reproducing audio signals from a data stream containing audio and control data, said control data being related to characteristics related in the original acoustic environment in which said audio data has been recorded, said system comprising:

a demultiplexer arranged to separate said audio and control data;
and

a playback circuit adapted to convert said audio data into audio signals at a local playback site in accordance with said control data to recreate the original acoustic environment.

And

A playback system for reproducing audio signals from a data stream containing audio and control data with information indicative of recording conditions in an original acoustic environment during the recording of said audio signals, said system comprising:

a demultiplexer arranged to separate said audio and control data; and

a playback circuit adapted to convert said audio data into audio signals in accordance with said control data to compensate said audio signals and recreate said original acoustic environment.

Note again the demultiplexer and the playback circuit that uses the control data to recreate the original acoustic environment of the recording site. There is nothing on the prior art references that discloses or suggests to a person skilled in the art a system receiving control signals or an operation of this type.

Independent claims 33, 34 all recite a system with a demultiplexer and circuitry for recreating the acoustic characteristic of the recording site.

In addition, the remaining claims also define the open or closed loop control as defined above. For example, claim 38 recites:

The system of claim 37 wherein said closed loop control circuit includes a test generator adapted to generate test signals, and a microphone adapted to sense sounds in said replay environment corresponding to said test signals, said microphone generating a microphone output indicative of said replay characteristics.

There is nothing in the prior art describing an open or closed loop control.

In conclusion, several important features distinguish the present invention from this system. First, the present invention is a playback system that can be used to detect standard signals on a recording media and play these standard signals back as sounds. No such recording media is disclosed in the primary Davis reference.

Second, the control signals are added to the sound signals on the recording media to allow the playback system to replay the sounds in a manner that simulates the acoustic characteristics of the recording environment.

Third the playback system uses information descriptive of the local or playback environment and combines this information with the information from the recording site to obtain a much higher quality replay. No such system is disclosed in the prior art.

Finally, for the latter feature two different control loops are proposed, neither of which is found in the prior art.

It is respectfully submitted that the subject application is patentably distinguishable over the prior art of record and therefore it should be allowed.

Date: New York, New York

Respectfully submitted,

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